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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/642,765 08/22/00 TAUGUCHI

T 1023/HIROSE

EXAMINER

027649
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1730 K ST NW
SUITE 304
WASHINGTON DC 20006

IM22/1102

COOKE, C

ART UNIT

PAPER NUMBER

1725
DATE MAILED:

11/02/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/642,765

Applicant(s)

TAUGUCHI ET AL.

Examiner

Colleen P Cooke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

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Claim Objections

Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form. Claim 2 recites the limitation that one of the metal powders is elemental Ag, Cu, or Sn. This fails to further limit claim 1 as claim has already stated that one of the metal powders may be elemental Ag, Cu, or Sn.

Claim 5 objected to because of the following informalities: The claim appears to contain a typographical error in that "plurlaty" should read as "plurality". Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by

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raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation of each Sn alloy powder including 0-8 mass % Ag, 0-5 mass % Cu, and at least 80 mass % Sn, and the claim also recites a composition when melted of 1-5 mass % Ag, 0.5-3 mass % Cu, and a remainder Sn which is the narrower statement of the range/limitation.

In addition, the claims are unclear because the beginning of the claim recites certain metal powders, one an Sn alloy powder and the other selected from Sn alloy, elemental Ag, elemental Cu, and elemental Sn powders, as being the components of the lead-free solder paste. However, either the broad or narrow later claim compositional ranges are only possible with certain combinations of these powders and not all the embodiments covered by the claim. This claim is very unclear due to the presence of three sets of ranges or limitations to the composition of the solder paste, all in one claim, such that the exact compositions covered by the claim are obscured.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 7, 8, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Paruchuri et al. (5928404).

With respect to claims 1, 2, and 7, Paruchuri et al. teaches a solder paste made by mixing two powders, a tin-silver alloy (96.5% Sn - 3.5% Ag) and 3-10% copper (Columns 3-4, lines 59-4).

With respect to claims 7, 8 and 12, Paruchuri et al. teaches that the solder paste may be printed onto a printed circuit board. A surface mount device is then placed on the solder paste and reflowed to form a solder joint (Column 5, lines 48-56).

Claims 1, 3, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson et al. (5527628).

With respect to claims 1 and 3, Anderson et al. teaches a solder composition of 93.6% Sn, 4.7% Ag, and 1.7% Cu (Column 2, lines 44-45), which can be a solder paste (Column 6, lines 16-18 and 34-37).

With respect to claims 8-10, Anderson et al. teaches that the solder may be used in reflow soldering, where the melting range is no more than 15° greater than the eutectic melting temperature, which is 217°C for this particular solder, yielding a melting range no more than 232°C (Column 2, lines 44-45 and Column 5, lines 3-12) and also that the solder paste be used with surface mount technology (Column 6, lines 34-37).

Claims 4-7 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Anderson et al. (5527628). Anderson et al. teaches a

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solder composition of 93.6% Sn, 4.7% Ag, and 1.7% Cu (Column 2, lines 44-45), which can be a solder paste (Column 6, lines 16-18 and 34-37)

It appears that the instantly claimed product by process is the same as that which is claimed (a solder alloy having 1-5% Ag, 0.5-3% Cu, and a remainder of Sn). When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. *In re Brown*, 173 USPQ 685 and *In re Fessman*, 180 USPQ 324. In the instant case, the claim is drawn to a solder paste but also claims making the solder paste by mixing different powders to achieve a desired final composition. The prior art teaches this desired final alloy composition, which is the same regardless of what alloy powders are combined to achieve this composition.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paruchuri et al. (5928404). Paruchuri et al. teaches the solder paste and soldering method of claims 1 and 8 respectively.

With respect to claims 9 and 10, although Paruchuri et al. does not teach the reflow soldering temperature of the particular solder composition, the reflow soldering temperature is

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dependent upon the materials. As the solder composition is the same as that which is claimed, the reflow temperature would necessarily be the same.

With respect to claim 11, Paruchuri et al. teaches that a surface mount device is placed on the solder paste and reflowed to form a solder joint (Column 5, lines 48-56), but does not specifically refer to a chip component. It would be obvious to mount a chip component because Paruchuri et al. teaches mounting any surface mount device, which would include a chip component.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. (5527628). Anderson et al. teaches a solder composition of 93.6% Sn, 4.7% Ag, and 1.7% Cu (Column 2, lines 44-45), which can be a solder paste used for surface mount technology (Column 6, lines 16-18 and 34-37).

With respect to claim 11, Anderson et al. teaches that a surface mount device and solder paste are reflowed to form a solder joint (Column 5, lines 3-12 and Column 6, lines 16-18, 34-37), but does not specifically refer to a chip component. It would be obvious to mount a chip component because Anderson et al. teaches mounting any surface mount device, which would include a chip component.

Likewise with respect to claim 12, Anderson et al. teaches using the solder paste in reflow surface mounting but does not specifically teach printing the solder paste. However, it would be obvious to print the solder paste because that is one of the most accurate, easily controllable, and widely available methods to apply solder paste to a substrate.

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Conclusion

Any inquiry concerning this or earlier communications from the examiner should be directed to Colleen Cooke, whose telephone number is 703-305-1136. She can normally be reached Monday-Thursday from 7:15-5:45pm.

If attempts to reach the examiner by telephone are unsuccessful, her supervisor, Thomas Dunn, can be reached at 703-308-3318. The official fax number for the organization where this application or proceeding is assigned is 703-305-6078. The unofficial fax number for this examiner is 703-746-3048.

Any inquiry of a general nature relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is 703-308-0661.

CPC 10/24/2001



TOM DUNN
SUPERVISORY PATENT EXAMINER
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